Remarks

Status of the Claims

Claims 1 – 21 were original in the application. Claims 1 – 10 have been withdrawn. Claim 11 has been amended. Therefore, claims 11 – 21 are submitted as being set forth in a clearly allowable condition or at least in better form for appeal.

Claim Rejections - 35 *USC* § *102*

Claims 11 - 21 were rejected as being anticipated by **Deliwala**, U.S. Patent Application 2003/0039430. The Examiner cited **Deliwala** as disclosing a tapered optical coupling comprising *inter alia* a funnel-shaped termination 9034/9024 (horn and channel) on a substrate 9012 which is optically coupled to the waveguide 9014. The Examiner relies on Figs. 85 – 87 and paragraph [0457] to show what is alleged to be a three dimensional funnel shaped termination which is tapered in two dimensions orthogonal to the waveguide axis. However, **Deliwala** describes a three dimensional funnel shaped termination **which is tapered in only one dimension** orthogonal to the waveguide axis and moreover uses an array of elements of with an index of refraction different than the termination to define the termination. Paragraph [0457] states:

> [0457] One embodiment of three-dimensional waveguide 9014 is shown in FIG. 87, and in top view in FIG. 85. The three-dimensional waveguide is formed from a plurality of alternating layers 9602, 9604, and 9606 that are secured to one another. Shallow pillars 9610 are provided one of the alternating layers 9602 that alter the dielectric constant of a photonic crystal formed by the shallow pillars 9610. From above, the shallow pillars

> 9602 are formed in an array configuration similar to as shown in FIG. 86. The layer 9604 positioned above layer 9602 includes another array of shallow pillars 9610 that produce an array of photonic crystals 9612 in layer 9604 similar as described above relative to the array of shallow pillars 9610 in layer 9602. This staggering occurs in a planer fashion as viewed from above. The staggering of the shallow pillars enhances the structural rigidity of the three-dimensional photonic band gap device. The array of shallow pillars 9610 in each layer 9602, 9604, 9606 is staggered relative to the array of shallow pillars in the respective layer above and below that layer. This staggering of the pillars 9602, 9604 provides for structural rigidity using a honeycomb like structure. Each layer is formed using regularly alternating dielectric patterns between the pillars, and the material between the pillars. The material of each layer 9602, 9604, 9606 may be individually selected based upon its dielectric characteristics to provide a variety of operations.

Hence **Deliwala** describes a termination in which the midchannel 9604 is a waveguide defined by an array of elements 9610 as shown in top view in Fig. 86 sandwiched between two layers of having an array of elements 9610 having a top plan view as shown in Fig. 85. What results is a termination which is tapered in only one direction. It is not clear how to use arrays to define a termination which is tapered in two orthogonal directions and which provides the required photonic performance. **Deliwala** certainly does not disclose any such structure.

The Examiner cites paragraph [453] and Fig. 82 as support, but this again shows a horn with a taper in only one plane. The Examiner cites Fig. 72 as support, but this shows a horn with a taper in only one plane, namely only in the plane of the substrate. The Examiner cites Fig. 66 as support, but this shows a horn with a taper in only one plane, namely only in the plane of the substrate.

Deliwala fails to disclose the claimed device by failing to show a termination which provides a funnel shape in two dimensions orthogonal to the waveguide axis.

Claims 12 – 21 depend directly or indirectly on claim 11 and are allowable therewith and for such further limitations as each claim may further include.

Claims 11, 14, 18 and 20 are rejected as being anticipated by **Meade et al.** U.S. Patent 5,526,449. The Examiner cited **Meade** for disclosing *inter alia* a full funnel-shaped termination 120. The Examiner cites Fig. 7a which clearly shows a taper in one plane only and then only defined by use of an array of refractive elements. The entirety of the disclosure regarding Fig. 12 is:

> FIG. 12 shows a waveguide taper or funnel 110 on a substrate 102 with a periodic dielectric structure 104. Many applications require a fiber optic cable 112 to be permanently attached to a waveguide 114 on an optical integrated circuit. This connection can lead to insertion loss on the order of 10 dB. To reduce the loss, the cable end 116 of the integrated waveguide 114 is made the same width as the cable 112. The optimum width of the circuit end 118 of the waveguide 114 is less than the width of the cable end 116. The width transition between the two ends is made of a taper section 120. This taper section 120 is a source of loss which can be overcome by the periodic dielectric structure 104.

There is no enabling disclosure in ***Meade*** how the funnel of Fig. 12 could be tapered in two planes orthogonal to the waveguide direction and further how that would be done without definition of an array of refractive elements. An alleged prior art reference cannot be applied, unless it is enabled. Otherwise, any statement conceivable as applied to any imaginable invention could be made in a published document without enablement to serve as a reference against every imaginable invention possible. The prior art must teach how to make and use the invention, if it is to be applied as a bar to the actually enabled invention.

Hence, **Meade** fails to anticipate each and every element of claim 11 as amended.

Advancement of the claims as amended to allowance is respectfully requested.

Respectfully submitted,

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